

Notice of Allowability

Application No.

10/054,424

Examiner

Mark Ruthkosky

Applicant(s)

WANG ET AL.

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/12/2004.
2. ☒ The allowed claim(s) is/are 1-4 and 7-30.
3. ☒ The drawings filed on 22 January 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Mark Ruthkosky 5/29/04

Mark Ruthkosky
Primary Patent Examiner
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DETAILED ACTION

Claim Rejections - 35 USC § 103

The rejection of claims 1 and 2 under 35 U.S.C. 103(a) as being unpatentable over Trefilov et al. (PCT/UA94/00018) in view of Gordon et al. (US 5,744,014) has been overcome by the applicant's amendment.

The rejection of claims 3-14 under 35 U.S.C. 103(a) as being unpatentable over Trefilov et al. (PCT/UA94/00018) in view of Gordon et al. (US 5,744,014) as applied to claims 1-2 and further in view of Mototani et al. (US 5,482,798) has been overcome by the applicant's amendment.

Allowable Subject Matter

Claims 1-30 are allowed.

The following is an examiner's statement of reasons for allowance:

Claims 1-15 are to an electrochemical cell capable of producing electrical energy comprising an anode of a zinc anode active material, an aqueous alkaline electrolyte solution comprising potassium hydroxide, a separator and a cathode comprising copper hydroxide, graphitic carbon and a sulfur additive selected from sulfur and sulfur compounds. The prior art does not teach an electrochemical cell with a zinc anode, a cathode comprising copper hydroxide, graphitic carbon and a sulfur additive selected from sulfur and sulfur compounds, and an alkaline electrolyte solution comprising potassium hydroxide.

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The most pertinent prior art has been disclosed. Primary and secondary alkaline storage batteries with zinc electrodes are well described in the art as noted in the instant specification. Manganese dioxide is a commonly used cathode active material in these systems. In addition cells with copper hydroxide in the cathode material are known. Trefilov et al. (PCT/UA94/00018), for example, teaches an electrochemical cell comprising an anode active material, an aqueous electrolyte solution, a separator and a cathode comprising copper hydroxide and copper chloride 55-85%, graphitic carbon 5-20% and a sulfur additive 1-25%. Zn is noted as being part of the anode on page 9 and Table 5. The electrolyte is an alkali salt in a water solution (examples.) The reference does not teach the electrolyte to be an alkaline electrolyte of KOH. As noted in the applicant's arguments, this battery is not an alkaline electrolyte battery and one of ordinary skill in the art would not be motivated to change the electrolyte to an alkaline solution of KOH. Licht (US 6,207,324 teaches an alkaline cell with a zinc anode and a hydroxide electrolyte, however the cathode is a sulfur electrode without copper hydroxide. The electrolyte does include hydroxides including copper, however, the material is not taught to be the cathode active material. As the prior art does not teach an alkaline battery with a zinc anode, a cathode comprising copper hydroxide, graphitic carbon and a sulfur additive selected from sulfur and sulfur compounds, and an alkaline electrolyte solution comprising potassium hydroxide, the claims are allowed.

Claims 15-30 are to an electrochemical cell comprising an anode active material, an aqueous alkaline electrolyte solution, a separator and a cathode comprising copper hydroxide, carbon nanofibers and a sulfur additive selected from sulfur and sulfur compounds. The prior art does not teach an electrochemical cell comprising an anode active material, an aqueous alkaline

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electrolyte solution, a separator and a cathode comprising copper hydroxide, carbon nanofibers and a sulfur additive selected from sulfur and sulfur compounds. The most pertinent prior art has been cited. For example, Trefilov et al. (PCT/UA94/00018) teaches an electrochemical cell comprising a zinc anode active material, an aqueous electrolyte solution, a separator and a cathode comprising copper hydroxide/copper chloride 55-85%, graphitic carbon 5-20% and a sulfur additive 1-25%. The reference does not teach an electrochemical cell comprising a KOH aqueous alkaline electrolyte solution and a cathode comprising copper hydroxide, a sulfur additive selected from sulfur and sulfur compounds and carbon nanofibers as part of the electrode as a conductive material. Carbon nanofibers are not taught in combination with these materials in the prior art. As such, the claims are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky

Primary Patent Examiner

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Mark Ruthkosky
5/29/04